Alcohol and Fetal Alcohol Spectrum Disorders

Clinical Associate Professor
Raewyn Mutch

Percentage of Global Disability Adjusted Life Years (total: 1.53 billion)

1. Childhood underweight
2. Unsafe sex
3. Alcohol use
4. Unsafe water, sanitation, hygiene
5. High blood pressure
6. Tobacco use
7. Suboptimal breastfeeding
8. High blood glucose
9. Overweight and obesity
10. Physical inactivity
11. Infant mortality
12. High cholesterol
13. Occupational risks
14. Iron deficiency
15. Maternal mortality
16. Low fruit and vegetable intake
17. Zinc deficiency
18. HIV/AIDS
19. Unmet contraceptive need

Conservative estimates:
3.2% of the global deaths
4.0% of the global DALYs.

Unintentional injuries contributed most to alcohol-attributable mortality burden
Neuropsychiatric diseases contributed most to alcohol-attributable disease burden

Alcohol Consumption Per Capita

Australia clearly has a drinking problem

- 20% of Australians drink at risky levels for long term harm > 2 std drinks per day (1)
- 40% of Australians drink at risky levels for short term harm > 4 drinks during a single drinking occasion (1)
- The cost to the community of alcohol consumption in Australia was estimated to be $15.3 billion in 2004/05 (2)

Throughout the Life course
There is an association between alcohol advertising exposure and alcohol expectancies:

- beliefs about the effects of alcohol
  - (Lipsitz et al. 1993; Stacy et al. 2004)
- drinking intentions
  - (Grube and Wallack 1994; Kelly and Edwards 1998)
- current or future drinking
  - (Casswell and Zhang 1998; Wylie et al. 1998)

**17.4% students aged 12-17 years are current drinkers**

- Involvement with alcohol increased with age
  - 8% of 13-year-olds
  - 37% of 17-year-olds.

- All older students, lower proportion drinking > 4 std drinks on any one occasion
  - 2005 (23%)
  - 2008 (18%)
  - 2011 (16%)
Current drinkers

- Greater than 1/3rd (37.0%) drank at risky levels
  > 4 std drinks on any one occasion

- Average no., of std drinks on any one occasion
  7.6 drinks by males
  5.6 by females

- 45.1% of 16-17 year olds
  “intend to get drunk”

Youth: overall use of alcohol has declined-risky drinking continued

Overall use of alcohol has been declining for the past six years
86% in 2005 to 74% in 2011 “ever consumed alcohol

“drinking patterns of adolescents in the final years of secondary school can be predictive of their drinking levels in the early years of adulthood”

Fetal Alcohol Spectrum Disorders

“Of all the substances of abuse, including cocaine, heroin, and marijuana, alcohol produces by far the most serious neurobehavioral effects in the fetus.”

IOM Report to Congress, 1996

In-utero exposure to alcohol

- Almost 50% of pregnancies are unplanned

- “Normal” Rates of drinking among a percentage of women is at a binge level

- Aboriginal women drink less than Non-Aboriginal women

- Asking about alcohol use difficult “ stigma

Alcohol is a teratogen - interrupts or alters the normal development of a fetus, including the development of the brain or other major organs
Animal Studies

- Dr K Sulik and team, University of North Carolina
- Limitations of animal studies

How much alcohol?

- We don’t know how much alcohol, if any, is safe to drink during pregnancy
- Evidence: risk of harm to the fetus is greater the more alcohol the mother consumes; binge drinking is harmful
- Not all children exposed to alcohol during pregnancy will be affected or affected to the same degree
- The level of risk to the fetus is hard to predict — broad range of effects are possible

How much alcohol?

- Timing (gestation) When during the development
- Frequency (throughout pregnancy) How often was there exposure
- Quantity (at each exposure) How much alcohol at each exposure

Example of dose and timing

- 10% random sample live births 1995-1996 — 61% follow-up at 8 years — Postpartum alcohol questionnaire (+3m) — CBCL
- Outcomes
  - High level alcohol 1st trimester
    - Anxiety/depression (OR 2.82), somatic complaints (OR 2.74)
  - Moderate levels of alcohol
    - Anxiety/depression (OR 2.24)

Fetal Alcohol Spectrum Disorders

- Fetal Alcohol Syndrome
- Partial Fetal Alcohol Syndrome
- Neuro-developmental disorders

Clinical Features of Fetal Alcohol Syndrome (FAS)
Embryology-time frame for the Brain

Palpebral Fissure

Facial Photography

Lip Circularity
Neurodevelopmental disorders

- Look ‘normal’
- Maybe verbal
- Often do NOT have a low IQ
- Say they know what to do
- Non-compliant and uncooperative
- Considered to be ‘bad’
- Poor understanding of time
- Negative self image and social skills

Is there any point diagnosing FASD?

Consequences of undiagnosed FASD

- Consequences of undiagnosed FASD
  - Broad and far reaching effects
- Undiagnosed FASD adversely affects their development
  - Loss of education
  - Loss of opportunities
- In turn affects whole families and the wider community
  - Increased costs of health
  - Increased costs of welfare services
  - Reduced educational opportunities
  - Reduced employment

Consequence of early engagement with juvenile justice (ABS statistics)

- Consequences of youth offending and youth victimisation
  - Broad and far reaching effects
- Youth victims and youth offenders have adverse effects on development
  - Loss of education
  - Loss of opportunities
- In turn affects whole families and the wider community
  - Increased costs of health
  - Increased costs of welfare services
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Develop: 2º...3º... 4º Disabilities

- Low self esteem
- Social exclusion
- Academic failure
- Unemployment
- Inability to live independently
- Mental health disorders
- Addiction
- Sexual deviance
- Problems with the justice system
  - Encounters with the law
  - Confinement
Executive Functioning

- Individuals with FASD have Executive Functioning problems:
  - First encoding, memory, learning and recall
  - Problem solving, remembering, changing
  - Difficulties socializing with peers + sharing
  - Managing conflicts, managing time

- Failures result in Rejection:
  - Higher probability of associating with other rejected children
  - Higher probability will be involved in delinquent behaviors
  - Higher probability will have problems with the law.

Areas of dysfunction

- Central Nervous System:
  - Below average intelligence
  - Delayed milestones
  - Motor abnormalities
  - Neurobehavioral disorders
  - Perceptual problems

- Neurobehavioral Disorders:
  - Hyperactivity
  - Poor attention span
  - Perceptual problems
  - Poor impulse control

- Language:
  - Late onset
  - Delayed use of sentences
  - Unseen expressive and receptive skills
  - Low quality masked by high fluency

- Behavioural:
  - Social inappropriateness
  - Persistent temper tantrums
  - Disengage friendliness
  - Fearfulness
  - Poor response inhibition
  - Processing deficits
  - Input/output, integration deficits
  - Short-term memory loss
  - Sensory hyperreactivity
  - Perseveration

Primary Difficulties 1.

- 1. Compromised executive functioning:
  - Difficulty planning, predicting, organizing, prioritizing, sequencing, initiating, and following through.
  - Difficulty setting goals, complying with contractual/expectations, being on time, or adhering to a schedule.

- 2. Difficulty with memory:
  - Information input, integration, forming associations, retrieval, and output.
  - Difficulty learning from past experiences.
  - Often repeats the same mistake over and over again in spite of increasingly severe punishment.

- 3. Inconsistent memory or performance:
  - May remember on Monday but forget by Tuesday.

Primary Difficulties 2.

- 4. Difficulty with abstract concepts
  - Such as time, math, or money.

- 5. Impaired judgment:
  - Often unable to make decisions.
  - Difficulty understanding safety and danger.
  - Fear of strangers.
  - Difficult distinguishing fantasy from reality.

- 6. Inability to generalize information:
  - Difficulty forming links and associations, unable to apply a learned rule in new setting.

- 7. Communication challenges:
  - Appears to understand instruction, rules and agrees, but is not able to comprehend.
  - Often repeats rules word for word, then fails to apply them.

Primary Difficulties 3.

- 8. Language problems:
  - Difficulty comprehending the meaning of language and accurately answering questions.
  - May agree or contribute-comply or fill in the blanks.
  - May talk excessively, yet be unable to engage in a meaningful exchange.
  - The sheer volume of words can create an impression of competence.

- 9. Slow cognitive pace:
  - May think more slowly, say “I don’t know,” shut down, or require minutes to generate an answer rather than seconds.
  - Those with FASD are “ten-second people in a one-second world.”

- 10. Slow auditory pace:
  - Central auditory delays mean language is processed more slowly, requiring more time to comprehend.
  - Many students only grasp a third word of normally paced speech.

- 11. Perseveration:
  - May be rigid, get stuck, have difficulty switching gears, stopping an activity, or transitioning to a new one.
  - Often reacts strongly to changes in setting, program, or personnel.

Diffusion tensor imaging (DTI) revealed structural abnormalities

- Delayed white matter development during childhood and adolescence in FASD.

- Longitudinal DTI and T1-weighted MRI
  - Completed in 17 participants with FASD and 27 controls.
  - Aged 5-13 years.
  - 2-3 scans each over 2-4 years.

- Three major white matter tracts most affected:
  - Superior longitudinal fasciculus.
  - Inferior longitudinal fasciculus.

- Reduced total brain, white, cortical, gray, and deep gray matter volumes.

- Fewer significant age-related volume increases in the FASD group.
Primary Difficulties 4.

12. Dysmaturity;
   - often functions socially, emotionally, and cognitively at a much younger level developmentally than chronological age. A five-year-old may be developmentally more like a two-year-old, a twelve-year-old more like a six-year-old.

13. Impulsivity coupled with inability to abstract and predict outcomes;
   - acts first and then is able to see the problem after the fact.

14. Sensory systems dysfunctions;
   - may be over-reactive to stimuli – e.g., tactile defensiveness, may be easily overwhelmed by sensory input, may be unable to filter out extraneous stimuli, symptoms of which appear as increased agitation, irritability, or aggression. May be under-reactive to pain, may not complain of earaches, broken bones, and may be unable to experience painful stimuli.

Secondary Difficulties 1.

1. Inappropriate humour; class clown
2. Pseudo-sophistication; may echo words, phrases, manners, and dress in order to “pass” as competent beyond their actual ability, often to their detriment
3. Fatigued, irritable, resistant, argumentative
4. Anxious, fearful, chronically overwhelmed
5. Frustrated, angry, defensive, destructive
6. Poor self concept, often masked by unrealistic goals or self-aggrandizement
7. Isolated, few friends, picked-on
8. Family or school problems including fighting, suspension, or expulsion
9. May run away or use other methods of avoidance
10. Trouble with the law, addictions
11. Depressed, may be self-destructive, suicidal

University of Washington; Children with a FASD

- 60% had a history of trouble with the law
- 50% had a history of confinement – jail, prison, residential drug treatment facility, or psychiatric hospital
- The average age beginning to have trouble = 12.8 years – easily led by others and tend to be impulsive.

Comparisons with common comorbidities

<table>
<thead>
<tr>
<th>Behaviour and response</th>
<th>FASD</th>
<th>ADHD</th>
<th>ODD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takes Risks</td>
<td>Does not perceive danger</td>
<td>Acts impulsively</td>
<td>Pushes the envelope, feels omnipotent</td>
</tr>
<tr>
<td>response</td>
<td>Provide mentor; utilize a list of repeated role play</td>
<td>Utilize behavioural approaches (e.g., stop and count to 10)</td>
<td>Psychotherapy to address issues; protect from harm</td>
</tr>
</tbody>
</table>

“These behaviours are not intentional; they are the result of permanent brain damage.”

“At some time between the ages of 6 and 12 years, 94% of children with FASD are diagnosed with a mental health disorder.”

Dr. Ira Chasnoff. October 18, 2007, Albany, NY.
### Behaviour and response

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<th>FASD</th>
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<th>ODD</th>
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<tbody>
<tr>
<td>Does not complete tasks</td>
<td>May or may not take in information; cannot recall information when needed; cannot remember what to do</td>
<td>Takes in information; can recall information when needed; gets distracted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Takes in information; can recall information when needed; choose not to do what they are told</td>
</tr>
</tbody>
</table>

### Hits Others

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<tr>
<td></td>
<td></td>
<td>Frequently an impulsive act</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plans to hurt others: misinterprets intentions of others as attack or impending attack</td>
</tr>
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### Reframing

**Observed behaviour**

**Underlying brain function**

**Respond to the underlying brain function**

Reframing observed behaviour:
- Underlying brain function
- Respond to the underlying brain function
- Repeated, replicated, small information bites, consistent universal response

Response always informed by an individual's neurocognitive strengths and weaknesses

**Eight magic keys, environmental adaptation, train the circle of security**

### Eight Magic Keys

- 1. Concrete
- 2. Consistency
- 3. Repetition
- 4. Routine
- 5. Simplicity
- 6. Specific
- 7. Structure
- 8. Supervision

Deb Evensen and Jan Lutke 1997

### Some resources

- Teaching students with FASD
- Eight Magic Keys

### How much alcohol?

**Guideline 3:** Children and young people under 18 years of age
- Under 18 years of age, not drinking alcohol is the safest option.

**Guideline 4:** Pregnancy and breastfeeding
- Maternal alcohol consumption can harm the developing fetus or breastfeeding baby.
  - A. For women who are pregnant or planning a pregnancy, not drinking is the safest option.
  - B. For women who are breastfeeding, not drinking is the safest option.

AUDIT-C Questionnaire

1. How often do you have a drink containing alcohol?
   a. Never
   b. Monthly or less
   c. 2-4 times a month
   d. 2-3 times a week
   e. 4 or more times a week

2. How many standard drinks containing alcohol do you have on a typical day?
   a. 1 or 2
   b. 3 or 4
   c. 5 or 6
   d. 7 or 8
   e. 10 or more

3. How often do you have six or more drinks on one occasion?
   a. Never
   b. Less than monthly
   c. Monthly
   d. Weekly
   e. Daily or almost daily

Three starter questions for asking about alcohol use in pregnancy

- Was your pregnancy planned?
- How many weeks were you when you recognised that you were pregnant?
- Did you change any of your lifestyle factors once you recognised that you were pregnant?
  - embed timing, frequency and dose of risk and protective factors
  - eg: alcohol with exercise, iron, omega 3, smoking, etc

Links

- http://rffada.org/

Thank you

Questions?

raewyn.mutch@health.wa.gov.au
raewyn.mutch@telethonkids.org.au
@RaewynMutch